CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF PESTICIDE REGULATION

MEDICAL TOXICOLOGY BRANCH

SUMMARY OF TOXICOLOGY DATA
MINERAL OIL - **JET FUEL**

Chemical Code # 00401, Tolerance # 00149
SB 950 # 754
Original date: 7/19/01

I. DATA GAP STATUS

Chronic, rat:	Data gap, no study on file
Chronic, dog:	Data gap, no study on file
Oncogenicity, rat:	Data gap, See Oncogenicity, mouse
Oncogenicity, mouse:	Data gap, inadequate study, possible adverse effect indicated
Reproduction, rat:	Data gap, no study on file
Teratology, rat:	Data gap, inadequate study, no adverse effect indicated
Teratology, rabbit:	Data gap, no study on file
Gene mutation:	No data gap, no adverse effect
Chromosomal aberration:	Data gap, inadequate study, possible adverse effect indicated
DNA damage:	Data gap, no study on file
Neurotoxicity:	Not required at this time

Toxicology one-liners are attached.

File name: T010719
** indicates an acceptable study.
Bold face indicates a possible adverse effect.
Original: Kishiyama & Silva, 7/19/01

II. TOXICOLOGY ONE-LINERS AND CONCLUSIONS

These pages contain summaries only. Individual worksheets may contain additional effects.

COMBINED, RAT

No Study Submitted.

CHRONIC TOXICITY, RAT

No Study Submitted.

CHRONIC TOXICITY, DOG

No Study Submitted.

ONCOGENICITY, RAT

See Oncogenicity, Mouse.

ONCOGENICITY, MOUSE

149 – 017 117310 "Tumorigenic evaluation of Jet Fuels JP-TS and JP-7, Following Vapor Inhalation Exposure," (Kinkead, E.R., Gaworski, C.L., Flemming, C.D., Harris, R., Witt, W., Davis, H., Schmidt, R.; Maintech Environmental Technology, Inc., Dayton, OH, University of California, Irvine, USAF School of Aerospace Medicine, Brooks Air Force Base, TX; Supported by DOD Contract #: F33615-90-C-0532; Published in The Toxicologist, #1390, 12(1):355, 1992). JP-TS and JP-7 are middle-distillate jet fuels that were vaporized to produce a chamber atmosphere similar to those encountered in field conditions. Fischer 344 rats and C57BL/6 mice were exposed for 1 year to 200 and 1000 mg JP-TS/m^3 or 150 and 750 mg JP-1/m^3 for 6 hours/day (5 days/week; 6/sex/dose/species). Histopathology was renal lesions in male rats (consistent with other light hydrocarbon inhalation studies). Renal neoplasms were increased in male rats during a 1 year observation period following the 1 year exposure. No treatment-related degenerative changes or increased incidence in tumors were observed in mice. Possible adverse effect indicated in male rats. Summary only; not a FIFRA Guideline study (no worksheet). M. Silva, 7/18/01.

REPRODUCTION, RAT

No Study Submitted.

TERATOLOGY, RAT

149 - 020 117320 "Inhalation/Teratology Study in Rats: Jet Fuel A (Final Report)," (Beliles, R.P.; Litton Bionetics, Inc., Kensington, MD; LBI Project #: 21035-01; 5/79). Jet Fuel A was administrated to CRL:COBS CD (SD) BR mated female rats (15-20/dose) in airborne concentrations of 0, 102.5 and 394.7 ppm for 6 hours/day during gestation days 6 through 15. Eye irritation or infection occurred for 10%, 35% and 100% of animals in the control, low and high dose groups, respectively. Maternal NOEL = 102.5 ppm Developmental NOEL > 400 ppm (There were no treatment-related effects at any dose.) UNACCEPTABLE (no dose selection rationale, too few dose levels, no individual maternal data, numerous deficiencies). Not upgradeable. No adverse effect indicated. (Kishiyama & Silva, 12/11/00).

TERATOLOGY, RABBIT

No Study Submitted.

GENE MUTATION

149 - 020 117327 "Mutagenicity Evaluation of Six Petroleum Substances in an *In Vivo/In Vitro* Urine Assay," (Jagannath, D.R.; Litton Bionetics, LBI Project #: 20988; 11/ 82). Urine was collected from male Sprague-Dawley rats, previously gavaged with Mineral Oil U.S.P., Jet Fuel A, Shale Oil RO-1, API-PS-8-76D5 or API-PS-8-76C5 at 5 ml/kg or API-PS-8-76C6 at 2.5 g/kg. The urine concentrates in DMSO were added at 25, 50, 100, 150, 200 and 300 µl/plate, then evaluated for mutagenic potential using *Salmonella typhimurium* strains TA98, TA100, TA1535 and TA1537. **Shale Oil RO-1 treatment was associated with an increase in the number of TA98 revertant colonies.** UNACCEPTABLE (major deficiencies). Not upgradeable. These data are supplemental. (Kishiyama & Silva, 1/24/01).

**** 149 - 022 117335A** *"In Vitro* and *In Vivo* Mutagenicity Studies Jet Fuel A," (Kapp, R.W. Jr.; Hazleton Laboratories America, Inc., Vienna, VA; Project #: 596-106; 8/13/79). Jet Fuel A (100% pure) was used on L5178Y mouse lymphoma cells at concentrations of 0, 100, 200, 400, 800, 1200, 1600, 2000 and 24000 µg/ml without S9 and at 0, 25, 50, 75, 100, 125, 150, 175 and 200 µg /ml with S9 (3 plates/dose) in a 4 hour exposure, followed by 2 days of cell expression. Single trial. **Mutation frequency was increased (2.3 to 5.4x) with Jet Fuel A at 100, 125, 150 and 175 µg/ml with metabolic activation (+S9).** ACCEPTABLE. (Kishiyama & Silva, 4/11/01).

** 149 - 022 117335B *"In Vitro* and *In Vivo* Mutagenicity Studies Jet Fuel A," (Kapp, R.W. Jr.; Hazleton Laboratories America, Inc., Vienna, VA; Project #: 596-104; 8/13/79). Jet Fuel A (100% pure) was used with *Salmonella typhimurium* strains TA1535, TA1537, TA1538, TA98 and TA100 in a plate incorporation mutagenicity assay at 0, 244.6, 733.7, 2201.2, 6603.7, 19811 and 39622 µg/plate (+S9) and at 0, 252.9, 758.7, 2276, 6828, 20484 and 40968 µg/plate (no S9). A repeat trial was performed at 0, 249.6, 748.7, 2246.1, 6738.3 and 20215 µg/plate (no S9). Jet Fuel A doses of approximately 20,000 and 40,000 µg/plate were not toxic to *S. typhimurium* but exceeded the limits of solubility. The number of revertants did not significantly increase with Jet Fuel A either with or without metabolic activation, when compared with negative controls. ACCEPTABLE. No adverse effect. (Kishiyama & Silva, 4/11/01).

CHROMOSOME EFFECTS

149 - 022 117335C *"In Vitro* and *In Vivo* Mutagenicity Studies Jet Fuel A," (Kapp, R.W. Jr.; Hazleton Laboratories America, Inc., Vienna, VA; Project No. 596-107; 8/13/79). Jet Fuel A was administered by inhalation to male albino Sprague-Dawley CR-1:COB®CD®[SD]BR rats (5/dose) at 0, 400 and 100 ppm (6 hours/day). Treatment was for 5 and 20 consecutive days at 400 and 100 ppm, respectively. After termination, bone marrow cells were taken from each animal and slides were made to assess cytogenicity. Fifty metaphase cells/animal were scored. Respiratory distress (gasping and sneezing) and a reddish nasal and eye discharge were evident at 100 and 400 ppm. Body weight was reduced at 400 ppm. **Chromosomal aberrations were increased at 100 and 400 ppm Jet Fuel A.** UNACCEPTABLE (numerous

deficiencies). Possible adverse effect indicated. Supplemental data. (Kishiyama & Silva, 4/11/01).

149 - 022 117341 "Mutagenicity Evaluation of Jet Fuel A in the Mouse Dominant Lethal Assay," (Brusick, D.J., Nguyen, T.D.; Litton Bionetics, Inc., Kensington, MD; LBI Project No: 21141-03; 12/80). Jet Fuel A, was administered to male CD-1 mice (12/dose, 6 hours/day; 5 days/week) via whole body inhalation (vapor) at 0, 100 and 400 ppm for 8 consecutive weeks (40 days total). Virgin, unexposed female mice were mated (48/dose, 2 week intervals) to the treated males soon after the final test article treatment. Dosing occurred during the entire spermatogenesis period. Jet Fuel A did not adversely affect fertility, implantation or resorptions in this study. The number of implants was reduced and resorptions increased with the positive control (TEM). Not acceptable, not upgradeable. (If the number of pregnant females is too low, then it is difficult to assess genetic damage to sperm. In this type of assay, large numbers of pregnant females are needed to assess genetic damage.) These data are supplemental. (Kishiyama & Silva, 4/30/01).

DNA DAMAGE

No Study Submitted.

NEUROTOXICITY

149 - 022 117343 "Neurobehavioral Toxicology of Petroleum- and Shale-Derived Jet Propulsion Fuel No. 5 (JP5)," (Bogo, V., Young, R.W., Hill, T.A., Cartledge, R.M., Nold, J., Parker, G.A.; Published in: Advances in Modern Environmental Toxicology Vol. VI; Chapter 2,1984; Armed Forces Radiobiology Research Institute and Naval Medical Research Institute, Bethesda, MD). **Inhalation Study:** P-JP5 and SJP5 were administered via inhalation to adult male Sprague-Dawley rats at 1000 and 1600 mg/m^3, respectively (6 hrs/day, 5 days/week for 6 weeks). **Gavage Study:** Rats received a single gavage treatment at 24 mg/kg. **Results:** Inhalation Study: water consumption increased from Day 8 through 30 with PJP5 and SJP5 treatment. Gavage Study: Body weight and food and water consumption were decreased 2-3 days after dosing and the activity of rats increased between 2.5 and 6 hours after dosing with PJP5 and SJP5.
No reported neurotoxicity was observed under study conditions. UNACCEPTABLE (too few dose levels, no females, no positive control, no analysis of dosing material, no individual data). No adverse effect indicated. These data are supplemental. (Kishiyama & Silva, 5/1/01).